Before the

FEDERAL COMMUNICATIONS COMMISSION

Washington, D.C. 20554

In the Matter of Inquiry Concerning the Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable And Timely Fashion, and Possible Steps To Accelerate Such Deployment Pursuant to Section 706 of the Telecommunications Act of 1996	)	GN Docket No. 04-54

COMMENTS
OF
NORTEL NETWORKS

Introduction

Nortel Networks (Nortel) is pleased to have the opportunity to comment in this important proceeding. We commend the Commission for initiating this fourth inquiry under section 706 of the Telecommunications Act of 1996 (the 1996 Act) into "whether advanced telecommunications capability is being deployed to all Americans in a reasonable and timely fashion." Nortel is delivering networking and communication services and infrastructure to service providers and enterprises in more than 150 countries. Customers in the United States, Europe, Asia-Pacific, the Caribbean and Latin America, the Middle East, Africa, and Canada benefit from Nortel's commitment to technology leadership and culture of innovation. Nortel is pleased to support the Commission, as it reviews various market, investment, and technological trends for the purpose of assessing and analyzing the extent to which infrastructure capable of supporting advanced services is being made available to all Americans.

Comments

In order to facilitate Commission review, Nortel's comments correlate to the paragraphs of the Commission's notice.[1]

Paragraph 11

The Commission presently defines "advanced telecommunications capability" and "advanced services" as services and facilities with an upstream (customer-to-provider) and downstream (provider-to-customer) transmission speed of more than 200 kbps.[2] In addition, since Congress specified that the term "advanced telecommunications capability" is defined "without regard to any transmission media or technology, as high-speed, switched, broadband telecommunications capability that enables users to originate and receive high-quality voice, data, graphics, and video telecommunications using any technology," it is important to also consider the bandwidth needs of various services or applications.[3]

Taking into account current and expected needs, Nortel advocates a goal of having available at least 10 Mbps to 20 Mbps of broadband capacity to every American in the near term, and 100 Mbps within the next decade. However, we also believe that this ambitious goal should neither be used to encourage the imposition of new nor the continuation of inappropriate regulations on less robust broadband capabilities.

There are those who believe that 1 or 2 Mbps to the home are sufficient for most broadband users. This is true if the only service being delivered to the subscriber is a

[1] Inquiry Concerning the Deployment of Advanced Telecommunications Capabilities to all Americans in a Reasonable and Timely Fashion, and Possible Steps to Accelerate Such Deployment Pursuant to Section 706 of the Telecommunications Act of 1996, GN Docket No. 04-54, FCC 04-55, released March 17, 2004 (hereafter cited as "NOI").
[2] NOI, p.4.
[3] Section 706 (c) of the 1996 Act.

data or Internet access type service. Under those circumstances, 1 or 2 Mbps may be sufficient. Most of the service provider equipment and infrastructure that has been deployed serving the residential sector meets this criterion with the exception of those subscribers who have reduced capability due to distance limitations. Across the globe, there is rapid ADSL deployment - with estimates of $4-5 billion in capital expenditures each year on access infrastructure.[4] In the United States, the top four service providers are increasing their DSL subscriber base at a rate of about 10% per quarter or approximately 2.5 million new subscribers for the year 2003.[5] It is important that any recalibration of "advanced telecommunications capability" or "advanced services" not function as an investment disincentive to the service providers deploying these broadband solutions today.

However, bandwidth standards must evolve with the innovative services and applications being developed and deployed. Broadband industry players are beginning to identify the voice, video (television) and data service bundle as the "triple play." But even the "triple play" will evolve. New multimedia services and applications will be created and bandwidth requirements will increase.

In view of the "triple play" and the statutory description of advanced communications, the Commission's focus should become the high-bandwidth needed to deliver multiple video rich applications to multiple (and simultaneous) users at a residence. In this context, "high-definition video requires 19.8 Mbps; DVD-quality video needs almost 4 Mbps; and even television quality requires 750 kbps or more.[6] Such

[4] Source: RHK 2003, InStat/MDR July 2003
[5] Source: RHK, 2003
[6] Comments of Intel Corporation, CC Docket No. 98-146, at p. 5.

application requirements in the context of multiple and simultaneous users at a single residence significantly increase broadband bandwidth requirements.

A proposal to the U.S. National Science Foundation points out that "much higher capacity access network offering services in the 10s to 100s of Mbps per household (or more) will be needed to fully unleash the potential of advanced communications infrastructure."[7]

Other nations have realized that increases in broadband capability might help them quickly outdistance traditional global leaders in terms of social and economic benefits. Recent statistics from the United Nations show that the United States ranks 11th in broadband deployment globally. In fact, "universal broadband access" (as it is currently defined) is no longer a sufficient goal. While the FCC's definition of broadband services includes only speeds that exceed 200 kilobits per second in both directions, other countries around the world are offering "ultra broadband" capabilities that provide access speeds of 20 Mbps to 100 Mbps – more than 100 times the current FCC standard.

Paragraph 26

The Commission states that it "does not directly monitor the development of innovative applications that utilize advanced telecommunications capability" and, "we therefore invite parties to bring to our attention technologies that might be used by

[7] Local Government Stimulation of Broadband: Effectiveness, E-Government, and Economic Development – *A White Paper from* A Proposal to the U.S. National Science Foundation Program on Digital Government, Division of Experimental and Integrative Activities, Directorate for Computer & Information Science & Engineering – submitted collaboratively by David Clark, Sharon Gillett, and William Lehr (Massachusetts Institute of Technology), Marvin Sirbu (Carnegie Mellon University), and Jane Fountain (Harvard University), p.4. (John F. Kennedy School of Government, Harvard University – Faculty Research Working paper Series)

current or potential providers to deliver new advanced services to consumers."[8] Nortel makes the following comments in response to the Commission's request.

Beyond Voice . . . the move to Multimedia Communications

In the 20th century, communications was dominated by a single medium - primarily voice. Important communication exchanges were conducted face-to-face so that participants could utilize a variety of media (voice, video/vision, text, etc.) to ensure clear communications of thoughts, ideas, emotions, etc. And this was relatively simple because the participants were either in the same location or could easily travel to meet in a common location.

At the start of the 21st century, we are witnessing a dramatic evolution in individual communications – both personal and business related. With the increased geographic dispersion of families, friends, and employees -- and an increasing reluctance/inability to travel -- face-to-face meetings for important communications are frequently no longer an option. Combined with the immediacy of certain communication exchanges, a communications gap has resulted.

Fortunately from the end user's perspective, technology is addressing that gap insofar as today's communications environment is characterized by numerous communications devices, such as home and business phones, pagers, cell phones, wireless PDAs, and PCs; a multitude of networks, including voice, data, and wireless; and a wide variety of applications, including voice, email, instant messaging, presence, file sharing, and video streaming.

Unfortunately, both consumer and enterprise end users are also feeling a little "walled in" by their communications solutions. Both groups have experienced significant

[8] NOI, p.9.

frustration with their inability to get different devices, applications, and even networks to work together.

Clearly, consumer and enterprise end users want to take advantage of multiple media (including text and video as well as voice) to enhance communications between employees, family, and friends – creating a virtual community by bringing the human touch of face-to-face contact to remote communications.

IP communication is unique in its ability to fill this need – and the multimedia communications gap – because it provides the common infrastructure necessary for the integration of communications by providing (1) ubiquity (and eliminating boundaries and enabling the delivery of a common set of services across multiple types of networks), (2) packetization (providing a common infrastructure for the integration of multiple media – voice, text, video), and (3) personalization (using the Web paradigm to customize an end user's communications to fit their specific needs, devices, and locations).

The need for a *convergence* of communications is really significant. The technology exists today that will bridge the barriers that exist between communications applications and between communications devices. Today, multimedia communications servers can provide the Internet communications services that can be divided into two categories – *Internet services that enhance PSTN voice services and voice services that enhance broadband services.* (A more detailed description of these services is included in Appendix A.)

PC-enhanced PSTN Voice

- Web-Based Call Control
- Web-based Contact Management.

- Broadband Video Service
- PC-based Multimedia Communications

Voice-enhanced Broadband Service

- PC-based Voice
- Broadband Voice
- Broadband Home Office

In the family-room or kitchen, Internet communication services allow for video calling using a television screen or video phone for rich communications with geographically distant family members and friends. In the home office, Internet communication services add both multimedia and communication-management services to the personal computer for increased productivity and communications control. These new Internet communication services seamlessly integrate the various networks, devices, and services together as one communication system. This technology is available today.

It is also important to note that wireless broadband access has also gained a strong foothold and will expand rapidly into the marketplace. Data capability, including messaging, e-mail and images are inherent in today's mobile devices. Today's data rates on tradition cellular networks are expected to substantially increase as newer technologies roll-out. WI-FI hot spots with data rates approaching the fastest wireline connection are available across the country in airport lounges, restaurants and other locations.

New technologies exist today that will deliver advanced communications services to the American consumer. The services outlined above (and described in Appendix A) could provide significant benefits to applications involving teleworking, telemedicine, E-

learning and distance education, as well as entertainment. The changing paradigm of personal communications in the early 21st century will be enabled by innovative new technologies that will rapidly close the multimedia communications gap and integrate currently disparate networks and services.

Paragraph 36

The Commission references its *Third Report* in which it described Commission action to promote broadband deployment. The Commission highlighted the following proceedings: the Cable Modem Notice; the Incumbent LEC Broadband Telecommunications Service Notice; the Triennial Review Notice; and the Wireline Broadband Internet Access Services Notice. Implications of the *Computer Inquiries* rules on broadband are also involved in some of these proceedings. The fact that these proceedings have not been concluded is slowing down the delivery of advanced telecommunications capability and valuable advanced services that will assist the expansion of the telecom sector. Speedy resolution of these proceedings would be a major positive step in accelerating the deployment of advanced telecommunications capability to all Americans, thereby meeting the objectives of the 1996 Act.

Conclusion

Nortel appreciates the opportunity to participate in this important proceeding. We agree with Congress and the Commission that the availability of infrastructure capable of transmitting broadband or advanced services is critical to the future of our nation.[9] As technological innovation continues to provide services and applications that are video-rich in orientation and to be used by multiple (and simultaneous) users at a residence,

[9] NOI, p. 2-3.

"ultra broadband" bandwidth will be required. This is why our goals for broadband must ultimately be raised. The services and applications enabled by broadband will play a vital role in the economy and the lives of our people.

Respectfully submitted,

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APPENDIX A

Nortel would also like to describe an innovative technology that it has developed which will enhance the communications capabilities of the American consumer and leverage service provider investments in broadband applications. The *Nortel Multimedia Communication Server* will deliver the promise of communications beyond voice, *i.e.* the multimedia communications experience.

Today's Consumer Communications Issues

Today's communications consumers are looking for more control over their voice services. They dislike unwanted calls and interruptions (such as a call-waiting tone during an important conversation), unwanted advertisements, lack of information on uncompleted calls, and a lack of mobility. They would like their communications to be personalized – for example, allowing them to choose to forward a call on a per-contact or contextual basis.

Today's consumers are also interested in participating in multi-dimensional conversations. As children, we learn one of the most important elements of a conversation is eye contact – and yet, to date, consumers have been limited to only voice or text communications. This no longer need be the case.

Today's devices, services, and networks do not all work together, and the proliferation of communications options has resulted in consumer confusion. Consumers, not surprisingly, tend to prefer easy over complex; they expect "instant" communications, and have little time to learn new commands for operating a new communication service. The more a service is able to coexist within their current communications environment, the more easily they will accept it.

These are challenging issues. But there are, today, solutions.

The Internet Communications Services Opportunity

Recent research shows that the introduction of Internet services to consumer communication offerings provides a significant opportunity to enhance existing consumer service bundles. Thus the question: What *are* the services that you can add to your service bundles?

Internet communication services available today can be divided into two categories – *Internet services that enhance PSTN voice services and voice services that enhance broadband services.*

PC-enhanced PSTN Voice

When we think of Internet communications services, most likely we think of voice over IP (VoIP). The fact is, though, that there are a number of Internet communication-service opportunities independent of VoIP. Several of these services do not even require a broadband Internet connection – they work very simply in conjunction with PSTN voice services. Some add value simply by replacing the phone dial pad with a PC-based graphical interface. Others extend communications beyond voice by adding high-quality video and collaboration tools. These services provide an opportunity to add to, rather than replace, existing voice services, and offer an opportunity to leverage Internet services.

Web-Based Call Control

Research shows that services that help consumers to better control their communications are the ones that have the highest customer value.[10] One such service is a personal communications Webpage that allows users to establish call screening "rules" for incoming calls to their various communication devices, automatically taking specific actions on specified calls. For example, instead of using a call-forward service that forwards all calls, consumers can now select certain incoming calls to ring all of their communications devices at once.

These services also address the issue of lack of mobile-communications control and allow for all services to peacefully coexist. Research indicates that broadband users

[10] Research results from primary market research commissioned by Nortel Networks and conducted by Pollara, Inc. in North America between 2002 and 2004.

are much more likely to have wireless phones than the mass population, and that as many as 33 percent of broadband consumers with wireless service would switch wireless service providers to obtain Internet-based call-management services for their wireless phones.[11]

Web-based Contact Management

Consumers have grown tired of managing separate contact lists for each of their devices. They may have contacts lists for their home computer applications, their offices, their wireless devices, and for specific activities, and are interested in new Web-based services that allow them to manage their contacts in a single place and to access this list from anywhere they have Internet access.

Broadband Video Service

Video calling is one of the highest valued new services among broadband consumers and is of even higher value to broadband home-office users. Research indicates that broadband home-office users are willing to pay as much as $8 more a month for a service bundle that contains video calling. Moreover, geographically dispersed family members have a strong emotional connection to a video calling service that would allow them to communicate with their relatives.[12] Broadband now allows for high-quality video to be delivered to the home – with the PC being the initial delivery device.

PC-based Multimedia Communications

The high penetration of the personal computer opens the door to integrating additional communications capabilities such as video, co-Web browsing, file sharing, instant messaging, and e-mail with voice service.

Broadband consumers are highly collaborative – especially broadband home-office users. Over a third of broadband consumers regularly discuss Website content with others, and are interested in a service that would allow them to "co-browse" the Web in real-time. And since over half of all broadband users download large files from the

[11] *Ibid.*
[12] *Ibid.*

Internet on a regular basis, they are interested in a broadband file-transfer service, one that would let them instantly send large files to collaborators – even files too large to e-mail.[13]

The Importance of Using Existing Home Phones

Consumers have clearly indicated they do not want to give up existing services to obtain a new service – for example, switching their voice service to a VoIP service that does not offer all custom-calling services or directory listings. They also do not want to be forced to use different devices for different contacts – for example, having to use a wireless phone instead of a home phone for lower-cost long distance service.

Unless IP services allow subscribers to keep using their existing home telephones, a service provider may miss the larger IP-services market opportunity. When choosing an IP-services platform, a service provider should ensure the platform has the capability to work with existing PSTN infrastructure.

Voice-enhanced Broadband Service

Using a personal computer for voice calls was initially of interest only to niche technology enthusiasts. Within the past few years, a few companies began offering PC-to-phone calling. Recently, consumer VoIP has taken a significant step by using broadband to separate VoIP from the personal computer.

Today consumer VoIP is very much in the mass-market deployment phase. Consumer interest in VoIP service is steadily increasing. The two immediate opportunities for consumer VoIP are services that reduce consumer communications costs and services that not only decrease costs but also increase home-office productivity.

PC-based Voice

Being able to place and receive calls on a personal computer and to review call information such as incoming and outgoing call logs are capabilities that interest consumers. PC-based voice services can allow single-line dial-up subscribers to continue to make and receive phone calls without affecting their Internet usage, and can

[13] *Ibid.*

also allow broadband subscribers to use their PC as an additional telephone device in the home. Research indicates that over half of all broadband users leave their home computers on all day.[14]

Broadband Voice

Broadband voice services allow consumers to use their home broadband connection to place and receive phone calls. Various forms of these services exist, including a broadband analog terminal adapter (ATA) that allows a traditional analog phone to be used to place calls over a broadband service, a PC-based "softphone" that provides a graphical interface, and new "wi-fi" cordless phones that connect to a 802.11b wireless LAN network to enable voice calling.

Broadband Home Office

For the work-at-homer, the bundling of an IP phone for voice with new integrated personal computer communications software can provide a seamless VoIP communications system. In stand-alone mode, the IP phone provides "always available" communications, even when the personal computer is turned off. In "PC-controlled" mode, the IP phone provides the voice to be used with the personal computer services.

This package serves not only to increase home-office productivity but also can leverage the inherent ubiquity of the Internet to more easily connect the home-office worker with geographically distributed co-workers. The Internet becomes a "virtual workspace," allowing users to engage in private instant messaging, file transfer, and Web collaboration, while also easily engaging in multi-person voice and video conferences.

Putting it All Together: Enhancing the "Triple Play" with Internet Communications

The "triple play" – voice, data, and video (television) in one package – is the top priority for many service providers, and other service providers are following suit. Service providers have learned that delivery of the triple play along with competitive pricing and differentiated, tiered services keep subscribers happy.

Adding Internet and wireless services into the picture significantly expands this opportunity. The wireless tie-in is a must in fully capturing the consumer's interest, and

[14] *Ibid.*

the new Internet communication services seamlessly tie the various networks, devices, and services together as one communication system.

In the family-room or kitchen, Internet communication services allow for video calling using a television screen or video phone for rich communications with long-distance family members and friends. In the home office, Internet communication services add both multimedia and communication-management services to the personal computer for increased productivity and communications control.

Summary – the technology and services described above are here *TODAY*

The services outlined above are available today with Nortel's *Multimedia Communication Server*. This *Multimedia Communication Server* can be configured as a stand-alone solution for ISP and broadband service providers that want to provide premium multimedia communications services, or as an integrated multimedia feature server as part of other Nortel network deployment solutions. The integrated solution is targeted at service providers with existing voice infrastructure that can be leveraged with these new next-generation services.

The Nortel *Multimedia Communication Server* provides for communications services that will simplify consumers' lives – by increasing their communications control, personalizing their communications to fit their individual needs, and increasing the capabilities of their communications beyond voice and text.